

Uncommon plant species of eastern deciduous floristic affinity, Riding Mountain National Park

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Introduction

Riding Mountain National Park covers an area of 2976 km² in south-western Manitoba. It is located in the southeastern extension of the Mixedwood Section of the Boreal Forest Region (Rowe 1972). The park, which has been described as an ecological island in a sea of agriculture (Bailey 1968), is situated on a plateau marking the transition from the first prairie level (the Manitoba Plain) to the second prairie level (the Saskatchewan Plain). The park is bounded to the east by a portion of the Manitoba Escarpment, to the north by a broad valley occupied by the Wilson and Valley rivers, and to the south by a plain that slopes gradually towards the Assiniboine valley. The upper reaches of the Assiniboine River form a broad valley separating the west end of the Park from the rest of the Saskatchewan Plain.

Riding Mountain lies within Köppen's Dfc (humid microthermal) climatic zone, characterized by a rain-snow climate of cold winters and warm summers. Total summer precipitation decreases from higher to lower elevations on the Escarpment, likely due to a "precipitation-shadow" that exists along the lower portion of the Escarpment. Summer maximum temperature is lower on the upland than on the Manitoba Plain. Annual rainfall ranges from 40.6-50.8 cm, with approx. 80% falling between April and October. June is the wettest month, having a mean rainfall of 9.8 cm. Wasagaming (50° 39'N 99° 58'W; 622 m asl) has a temperature range of -19.7°C (mean January) to 16.5°C (mean July), with a mean daily temperature of 0.0°C. Mean annual growing season is between 160-180 days. The area has an average of 105 frost-free days from May 25-30 to September 10-15.

The Park encompasses three major ecosystem elements: the northern boreal forest, the central grasslands, and the eastern deciduous forest. The eastern deciduous forests occur at the base of the Manitoba Escarpment, in the eastern and north-eastern portions of the Park. These stands, which represent the extreme north-western limit of eastern deciduous forest in North America, occur on moist, nutrient-rich, calcareous sandy

loam substrates. The major tree species are green ash (*Fraxinus pennsylvanica*), Manitoba maple (*Acer negundo*), American elm (*Ulmus americana*) and bur oak (*Quercus macrocarpa*). White birch (*Betula papyrifera*), trembling aspen (*Populus tremuloides*), balsam poplar (*P. balsamifera*) and plains cottonwood (*P. deltoides*) may also be present at low abundance. Mountain maple (*Acer spicatum*) occasionally reaches tree size in these stands. The dominant tall shrubs are beaked hazelnut (*Corylus cornuta*), choke cherry (*Prunus virginiana*), American bush-cranberry (*Viburnum trilobum*), and downy arrowwood (*V. rafinesquianum*). The understory is floristically diverse. The most abundant species are wild sarsaparilla (*Aralia nudicaulis*) and ostrich fern (*Matteuccia struthiopteris*). A number of species of eastern deciduous floristic affinity (sensu Love 1959) occur in the understory, including coneflower (*Rudbeckia laciniata*) and the common hop (*Humulus lupulus*). Species of eastern deciduous affinity that are at or near their northern and/or western limits in the Park are discussed in greater detail below.

Bryophytes

Records of bryophytes (mosses and liverworts) in western Manitoba and adjacent Saskatchewan are sketchy at best. The three moss species included here were found in the moist, nutrient-rich eastern deciduous forests at the base of the Manitoba Escarpment. They are almost certainly locally rare in western Manitoba.

Anomodon minor (Hedw.) Furnr.

This pleurocarpous species typically grows on trunks or bases of trees, but may also be found on logs, stumps and rocks. It prefers calcareous habitats (Crum 1976). The species is widespread in eastern North America as far south as Mexico, western Texas and Arizona. It also occurs in eastern Asia. Specimens in the University of Manitoba herbarium are from the Winnipeg area (growing on bur oak, green ash, and rotting logs in riverbank gallery forests), and from the Thunder Bay district (growing on black ash).

This species is likely at its north-western distributional limit in the Riding Mountain area. It was encountered at four sites along the Manitoba Escarpment, in forests dominated by bur oak, green ash, American elm and/or Manitoba maple.

Callicladium haldanianum (Grev.) Crum (Shiny-Leaf Moss)

This pleurocarpous species is typically found growing on logs or stumps, but it may also occur at the base of trees (Crum 1976). It prefers partially shaded habitats such as open woods and brushy thickets. The species is widespread in eastern North America (from Nova Scotia to Manitoba), but it also occurs sporadically along the west coast. It is also found in Europe and Asia. Specimens in the University of Manitoba herbarium are from the Thunder Bay district (on rotting logs), and from a floodplain in southern coastal British Columbia. The herbarium has no specimens from Manitoba.

This species is likely at its north-western distributional limit (for eastern North America) in the Riding Mountain area. The species was found at several sites across a wide range of habitats in the Park. It was most commonly encountered at the base of the Manitoba Escarpment in stands dominated by bur oak, green ash, American elm and/or Manitoba maple. More occasionally, it was found in stands of white spruce, trembling aspen, balsam poplar and/or paper birch.

Rhodobryum roseum (Hedw.) Limpr. (Rose Moss)

This is an acrocarpous species that typically grows on thin humus or soil over boulders in woods, but may also be found on the forest floor, on logs, and on tree bases (Crum 1976). The species is circumpolar in distribution. In North America, it is found from Newfoundland to Manitoba (south to North Carolina and Arkansas), and in British Columbia and Alberta (south to Arizona and Mexico). Previous collections from Manitoba has all been from the extreme south-east corner of the province (Whiteshell region).

This species was collected only once in the Park, in a mixed stand of balsam fir and paper birch south of Scott's Creek.

Graminoids

Milium effusum (L.) (Millet Grass)

This species has a curious distribution in North America. In Ontario, Dore and McNeill (1980) note that it is highly sporadic in occurrence, and that dense and continuous populations are rare. It occurs mainly in

southern Ontario, but isolated populations also occur along Lake Superior, in the Rainy River area, and in calcareous forests north of New Liskeard. Millet grass reaches its northwestern distributional limit in Manitoba, where it is considered to be very rare (Looman and Best 1994; Scoggan 1978). It was collected in Riding Mountain National Park by Cody (1988), in "understory in open woodland in the eastern parts of the Park; rare". We found the species in four sites: two in mixed stands of white spruce, trembling aspen and/or balsam poplar south of Moon Lake; one in an aspen stand (with some bur oak and Manitoba maple) at the north end of the Park along the Crawford Creek trail; and a fourth at the base of the Manitoba Escarpment (immediately north of McKinnon Creek) in a forest dominated by green ash, American elm and Manitoba maple.

Herbs

Phyrma leptostachya L. (Lopseed)

This species has not been previously collected from Riding Mountain National Park. Lopseed is a characteristic eastern deciduous forest species, typically occurring in moist calcareous woods in southern Ontario. It is considered rare in Manitoba (Looman and Best 1994). Previous collections are from south-eastern Manitoba (as far west as Gladstone), but it is not listed as occurring in the Park (Cody 1988). Lopseed was found near the Henderson pickup (50° 51.5'N, 99° 41.0'W), in the understory of a forest dominated by green ash, American elm and Manitoba maple.

Amphicarpa bracteata (L.) Fern (Hog-Peanut)

Another species of eastern deciduous affinity, hog-peanut is a twining plant that grows in woods along rivers and in ravines. It is considered to be uncommon in Manitoba (Looman & Best 1994) and has not been collected in Saskatchewan (Scoggan 1978). In Manitoba, the species is locally abundant in gallery forests of the Red River drainage basin. It has been collected at Lake Dauphin and The Pas, but is very rare that far north. In the Park, Cody (1988) lists the species as "rare and localized", occurring in "moist situations below the Escarpment". We encountered the species along the eastern border of the Park just north of McKinnon Creek, in a forest dominated by green ash, American elm and Manitoba maple.

Trillium cernuum L. (Nodding Trillium)

Nodding trillium is an eastern deciduous forest species that typically occurs in moist woodlands. The

species is uncommon in Manitoba (Looman and Best 1994) and reaches its north-western limit in eastern Saskatchewan (Maher et al. 1979), specifically in the Red Deer and Assiniboine valleys near the Manitoba border. Cody (1988) lists the species as rare in the Park. We found nodding trillium in a number of sites along the base of the Manitoba Escarpment, in forests dominated by green ash, American elm and Manitoba maple.

Shrubs and woody climbers

Cornus alternifolia L. f. (Green Osier)

This tall shrub occurs in the understory of deciduous forests in eastern North America (Farrar 1995). It is found in the Maritimes, in southern Ontario and Quebec, and in isolated locations in northwest Ontario and southern Manitoba. The species is considered to be rare in Manitoba (Looman & Best 1994) and Riding Mountain (Cody 1988). We found the species growing as a small, low shrub in moist forests dominated by balsam poplar. We found the species as far west as Deep Lake, which represents a western extension of the species distribution.

Parthenocissus inserta (Kerner) Fritsch (Virginia Creeper)

This eastern species is occasionally found in moist woodlands in southern Manitoba (Looman and Best 1994), but it is not native to Saskatchewan. It occurs as far north as Hecla Island, and as far west as Riding Mountain and Oak Lake. Cody (1988) lists Virginia creeper as rare at Riding Mountain. We encountered the species in eastern deciduous stands (green ash, American elm, Manitoba maple) at the base of the Manitoba Escarpment.

Celastrus scandens L. (Climbing Bittersweet)

In Manitoba, this eastern deciduous forest species occurs in rich gallery forests of river valleys and ravines (Looman and Best 1994). The species occurs as far west as southern Saskatchewan, but is very rare in that

province (Maher et al. 1979). It is also considered rare in Riding Mountain (Cody 1988). We found the species in a few locations along the Manitoba Escarpment, in forests dominated by American elm, green ash, Manitoba maple, bur oak and/or balsam poplar.

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